

THE SNAKE THAT SWALLOWED ITS TAIL

Once upon a time (in 1865, to be more exact), a German chemist named Friedrich August Kekulé von Stradonitz was sitting beside his fireplace. He drifted off to sleep and had a dream. Accounts of Kekulé's dream vary, but in most versions, he saw a snake swallowing its own tail.

As dreams go, Kekulé's may not seem all that remarkable. People dream far stranger things—for example, people dream that they are able to breathe underwater, read people's minds, or fly. In dreams, our wildest fantasies can seem absolutely real.

What is a fantasy, exactly? One dictionary defines it as "the free play of creative imagination." And in the imagination, whether waking or sleeping, impossible things can happen. Of course, you can fantasize about *possible* things easily enough. You can imagine yourself shooting the winning basket in the big game, or getting some cool new clothes. But why stop there? In the privacy of your own fantasies, why not imagine yourself the king or queen of the galaxy?

On the other hand, why bother to fantasize at all? Of what real use are fantasies? Wish fulfillment is one possibility. According to psychiatrist Sigmund Freud, this is why we dream. In waking life, he explained, we are constantly aware of what we *can't* do. Our nighttime dreams offer us an escape from our resulting frustration—and so, it would seem, do our daydreams.

If this is so, it is not surprising that there is such a huge market for wish fulfillment. Our culture swamps us with fantasies in books, television shows, movies, popular songs, and advertisements. People are ready and willing to pay good money to escape from reality.

But does it really make sense to call all dreams and fantasies mere wish fulfillment? For example, what kind of wish does a dream like Kekulé's satisfy? Does anybody really wish that snakes could swallow their tails?

As it happened, Kekulé was pondering a scientific problem before he dozed and dreamed. He had been studying a substance called benzene, which had been discovered in 1825. Benzene had already proven useful as a solvent and a fuel, but nobody understood its molecular makeup.

Molecules are microscopic building blocks of matter. Molecules, in turn, are made out of even smaller particles called atoms. Kekulé was trying to understand the shape of a benzene molecule. How were its atoms arranged?

Kekulé was stumped by this problem—until he had his dream. He awoke with the image of the snake swallowing its tail in his mind. And suddenly, he had his answer. The benzene molecule was shaped like the snake! Its atoms were arranged in a circle!

Many other scientific breakthroughs have arisen from dreams or daydreams. In fact, scientists often speak of fantasy with great respect. As the great physicist Albert Einstein once remarked, “The gift of fantasy has meant more to me than my talent for absorbing positive knowledge.”

Indeed, stories like that of Kekulé’s dream suggest that fantasy is very useful. Too often, a so-called “realistic” attitude can mean overlooking realities that are right under our noses. In 1901, a brilliant astronomer named Simon Newcomb convincingly argued that machine-powered, human-piloted flight was scientifically impossible. Two years later, Wilbur and Orville Wright flew the first airplane, fueled by untold ages of dreams and fantasies.

Allowing our minds to wander into realms of the impossible can wake us up to unnoticed possibilities. When this happens, fantasy is much more than a form of escape. It is nothing less than a key to discovery.